UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/937,796	01/28/2002	Mitsuhiro Koden	70904-56520	7040

21874 7590 04/25/2005

EDWARDS & ANGELL, LLP
P.O. BOX 55874
BOSTON, MA 02205

EXAMINER	
LAVARIAS, ARNEL C	

ART UNIT	PAPER NUMBER
2872	

DATE MAILED: 04/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/937,796	KODEN ET AL.	
	Examiner	Art Unit	
	Arnel C. Lavarias	2872	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 February 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-40* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-40* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. The amendments to Claims 1, 2, 11, 13, and 14 in the submission dated 2/17/05 are acknowledged and accepted. In view of these amendments, the rejections of Claims 1-30 under 35 U.S.C. 112, 2nd paragraph, in Section 7 of the Office Action dated 12/15/04 are respectfully withdrawn.

2. The addition of Claims 31-40 in the submission dated 2/17/05 is acknowledged and accepted.

Response to Arguments

3. The Applicants' arguments filed 2/17/05 have been fully considered but they are not persuasive.

4. The Applicants argue that, with respect to newly amended Claims 1, 2, 11, 13, and 14, the combined teachings of Ge et al., Bitzakidis et al., and Fergason fail to teach or reasonably suggest the optical control device and method, wherein the at least one output layer shines when a specified time has elapsed such that the liquid crystal between each of the first and second substrates is able to respond to the scan signals and signal voltages to modulate light intensity transmitted therethrough to a desired display intensity after a complete set of data signals for each scan line is transmitted to the first electrodes and extinguishes before a succeeding complete set of data signals for each scan line is transmitted. The Examiner disagrees. Each display panel field period F(A), F(B), F(C),

and F(D) (See VS in Figure 3) during which a single TV field is addressed and displayed has two separate address periods (See DP in Figure 3). The first period f(A), f(B), f(C) (See Figure 3) corresponds to the time during which the TV field information is written to the picture elements. The second period D (See Figure 3) corresponds to those dormant time periods during the picture elements of the panel are left unaddressed. It is also during this time period D where the illumination source is turned on to illuminate the display panel (See I in Figure 3; See also col. 9, line 16-col. 11, line 26). Thus, while the illumination source is turned off, TV field information is written to the picture elements. Then, once the information is completed, the illumination source is turned on for a set duration, then turned off, and a new set of TV field information is written to the picture elements.

5. The Applicants additionally argue that the combined teachings of Ge et al., Bitzakidis et al., and Fergason fail to teach or reasonably suggest the light output layer being adjusted in terms of luminance to a maximum luminance of the data signals for each scan line. The Examiner respectfully disagrees. Ge et al. discloses, for example, that the light output of the source (e.g. EFD 34 in Figure 1), after passing through the LCD panel, may be varied in intensity (i.e. various tones of red, green, and blue) based on the LCD addressing provided to LCD Row and LCD Column drivers (See 102, 106 in Figure 2) driven from the analog input signal (See 101 in Figure 2). Thus, the luminance output of the light source, after passing through the LCD panel, is adjusted based on the applied data signals. In this case, since only the LCD panel alters the intensity of the light, the maximum intensity passing through the LCD panel due to the light source is based on the

input data signal provided to the LCD Row and LCD Column drivers of the panel (See in particular col. 5, line 16-col. 6, line 52).

6. Claims 1-40 are now rejected as follows.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

8. Claims 31-40 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claims 31-35 all recite the limitation that a transmittance of the liquid crystal is controlled according to the maximum luminance of the light output layer. The specification and drawings of the disclosure appear not to specifically disclose this feature. It is readily apparent from the disclosure that the transmittance of the liquid crystal is controlled by the data signals for each scan lines (See for example Figure 3 of Applicants' disclosure), and that the light output layer is adjusted in terms of luminance to a maximum luminance of the data signals for each scan line (See for example Pages 26-27 of Applicants' disclosure). However, subject matter regarding the liquid crystal being controlled according to the maximum luminance of the light output layer does not

appear to be supported by the disclosure. Claims 36-40 are dependent on Claims 31-35, and hence inherit the deficiencies of Claims 31-35.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. Claims 1, 9-13, 21, 23-24, 26, 28-29, 31, 33-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ge et al. (U.S. Patent No. 5402143), of record, in view of Bitzakidis et al. (U.S. Patent No. 5912651), of record.

Ge et al. discloses an optical control device and optical control device method that does not use a color filter (See Figures 1, 4; col. 7, lines 28-52), both comprising a first substrate (See 72 in Figure 1) with at least one light output layer (See 34 in Figure 1), adjusted in terms of luminance for each gate electrode and in accordance with a maximum luminance which is based on the signal voltages applied to the source/signal electrodes (See col. 4, lines 23-col. 9, line 9); a second substrate with a light transmitting function (See 46 in Figure 1), positioned opposite to the first substrate; a liquid crystal sandwiched between the first and second substrates (See 32, 56 in Figure 1) wherein a transmittance of the liquid crystal is controlled according to the maximum luminance of the light output layer and the data signals for each scan line (See in particular col. 5, line 16-col. 6, line 52), first gate/scan electrodes, on one of the first and second substrates, for

applying multiple scan signals to the liquid crystal for an image display (See 54 in Figure 1), and second source/signal electrodes, on the other of the first and second substrates, for applying multiple signal voltages to the liquid crystal for an image display (See 52 in Figure 1); and a layer with a light polarizing function on the first substrate (See 44 in Figure 1), wherein the light output layer is arranged in stripes and extends in the same direction as the first electrodes (See 78 in Figure 1); and the first substrate, the light output layer, the layer with a light polarizing function, the liquid crystal, and the second substrate are arranged in this order (See Figure 1). Ge et al. additionally discloses the light output layer provided on the first substrate being formed by a light emitting layer composed of a fluorescence device (See 34 in Figure 1; Abstract); the light emitting layer shining with application of a voltage across the first electrodes and the second electrodes (See col. 10, line 44-col. 12, line 59); the light output layer shining with spectrum periodically varying according to a position of the light output layer and varying with each pixel (See 78 in Figure 1); each output layer being either red, green, or blue so that red, green, and blue repeat periodically (See 78 in Figure 1), and the light output layer shining (See for example 352 in Figure 14) for a duration of approximately 15%-40% of each display frame time (See for example Figure 14; col. 12, lines 20-33; it is noted that the frame time is taken as the pulse width of output light pulses 360 in Figure 14); the layer with the light polarizing function being provided on the light output layer (See 34, 44 in Figure 1). Ge lacks the light output layers shining when a specified time has elapsed such that the liquid crystal between each of the first and second substrates is able to respond to the scan signals and signal voltages to modulate light intensity transmitted

therethrough to a desired display intensity after a complete set of data signals for each scan line is transmitted to the scan/gate electrodes and extinguishing before a succeeding complete set of data signals for each scan line are transmitted. However, such impulse-type drive mechanisms are well known in the art of displays devices, particularly liquid crystal display devices. For example, Bitzakidis et al. teaches a liquid crystal matrix display system (See for example Figures 1-2), wherein the light output layer (See 19 in Figures 1-2, and may include a fluorescence light source) shines only when a specified time has elapsed such that the liquid crystal between each of the first and second substrates is able to respond to the scan signals and signal voltages to modulate light intensity transmitted therethrough to a desired display intensity after a complete set of data signals for each scan line is transmitted to the scan/gate electrodes and extinguishing before a succeeding complete set of data signals for each scan line are transmitted (See specifically the timing diagram shown in Figure 3, wherein the illumination source is turned on only after a series of scan pulses f(A) have been applied to the appropriate electrodes, and the illumination source is turned off prior to applying another series of scan pulses. See also col. 6, line 37-col. 11, line 25). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the light output layers shine when a specified time has elapsed such that the liquid crystal between each of the first and second substrates is able to respond to the scan signals and signal voltages by reaching its desired display intensity after a complete set of data signals for each scan line is transmitted to the scan/gate electrodes and extinguish before a succeeding complete set of data signals for each scan line are transmitted, as taught by

Bitzakidis et al., in the optical control device and optical control device method of Ge et al., to reduce unwanted visual effects (e.g. smearing) while providing improved display quality when displaying moving images.

11. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ge et al. in view of Bitzakidis et al. as applied to Claim 1 above, and further in view of Hodson et al. (U.S. Patent No. 5760858), of record.

Ge et al. in view of Bitzakidis et al. discloses the invention as set forth above in Claim 1, except for the light output layer being composed of at least one of an organic/inorganic electroluminescent (EL) light emitter and an FED light emitter. It is well known in the art of LCD displays to utilize field emission based lighting and EL based lighting in LCD display devices (See for example Figure 7-8 for a field emission based backlight). Additionally, Hodson et al. teaches a field emission based liquid crystal display (See Figure 4) wherein the integrated backlighting includes an FED device (See 1, 2, 4 in Figure 4; Abstract). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the output layer of the optical control device of Ge et al. in view of Bitzakidis et al. be composed of an FED light emitter, as taught by Hodson et al., for the purpose of increasing the light output efficiency of the LCD display, while reducing power consumption.

12. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ge et al. in view of Bitzakidis et al. as applied to Claim 1 above, and further in view of Kimura et al. (U.S. Patent No. 5535027), of record.

Ge et al. in view of Bitzakidis et al. discloses the invention as set forth above in Claim 1, except for the light output layer including an optical waveguide and a light source coupled to the optical waveguide and positioned in a non-display section area. However, Kimura et al. similarly teaches a liquid crystal display device (See for example Figures 1-7) wherein the light output layer is formed by a combination of an optical waveguide (See for example 22 in Figures 3-4) and a light source (See for example 21 in Figures 3-4) coupled to the optical waveguide and positioned in a non-display section area (See left side of Figure 4 where 21 is located at). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have for the light output layer provided on the first substrate be formed by a combination of an optical waveguide and a light source coupled to the optical waveguide and positioned in a non-display section area, as taught by Kimura et al., in the optical control device of Ge et al. in view of Bitzakidis et al. for the purpose of reducing the amount of power consumed by the device since light is no longer wasted in illuminating portions of the display panels that are not required to be illuminated (i.e. light is guided only to those areas of the panel that requires illumination).

13. Claims 2-4, 14-20, 22, 25, 27, 30, 32, 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ge et al. in view of Bitzakidis et al. as applied to Claims 1, 9-13, 21, 23-24, 26, 28-29, 31, 33-34 above, and further in view of Fergason (U.S. Patent No. 5572341), of record.

Ge et al. in view of Bitzakidis et al. discloses the invention as set forth above in Claims 1, 9-13, 21, 23-24, 26, 28-29, 31, 33-34, except for the output layer shining with

mutually different wavelengths from those of adjacent light output layers and more than one light output layers that shine with mutually different wavelengths are caused to shine simultaneously. However, it is well known in the art of LCD displays along with field sequential color addressing of red, green, and blue pixels in an LCD display, simultaneous addressing of red, green, and blue pixels in an LCD display may also be performed to generate a full-color display image. For example, Fergason teaches that a full color display image from an LCD display panel may be generated by both methods (See Figures 1, 8, 11, 14; col. 21, line 43-67). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the output layer shine with mutually different wavelengths from those of adjacent light output layers and more than one light output layers that shine with mutually different wavelengths are caused to shine simultaneously, as taught by Fergason, in the optical control device and optical control device method of Ge et al. in view of Bitzakidis et al., for the purpose of reducing jittering or flickering of the display image, as well as reducing the scanning frequency requirement of the image display system (i.e. since only 1/3 of the pixels require to be scanned (all three colors are scanned simultaneously instead of each color being scanned individually), the scanning frequency is reduced to 1/3 the value of that in a field sequential color addressing scheme), thus reducing the complexity of the display device.

14. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ge et al. in view of Bitzakidis et al., and further in view of Fergason as applied to Claim 2 above, and further in view of Hodson et al.

Ge et al. in view of Bitzakidis et al., and further in view of Fergason discloses the invention as set forth above in Claim 2, except for the light output layer being composed of at least one of an organic/inorganic electroluminescent (EL) light emitter and an FED light emitter. It is well known in the art of LCD displays to utilize field emission based lighting and EL based lighting in LCD display devices (See for example Figure 7-8 for a field emission based backlight). Additionally, Hodson et al. teaches a field emission based liquid crystal display (See Figure 4) wherein the integrated backlighting includes an FED device (See 1, 2, 4 in Figure 4; Abstract). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the output layer of the optical control device of Ge et al. in view of Bitzakidis et al., and further in view of Fergason be composed of an FED light emitter, as taught by Hodson et al., for the purpose of increasing the light output efficiency of the LCD display, while reducing power consumption.

15. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ge et al. in view of Bitzakidis et al., and further in view of Fergason as applied to Claim 2 above, and further in view of Kimura et al.

Ge et al. in view of Bitzakidis et al., and further in view of Fergason discloses the invention as set forth above in Claim 2, except for the light output layer including an optical waveguide and a light source coupled to the optical waveguide and positioned in a non-display section area. However, Kimura et al. similarly teaches a liquid crystal display device (See for example Figures 1-7) wherein the light output layer is formed by a combination of an optical waveguide (See for example 22 in Figures 3-4) and a light

source (See for example 21 in Figures 3-4) coupled to the optical waveguide and positioned in a non-display section area (See left side of Figure 4 where 21 is located at). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have for the light output layer provided on the first substrate be formed by a combination of an optical waveguide and a light source coupled to the optical waveguide and positioned in a non-display section area, as taught by Kimura et al., in the optical control device of Ge et al. in view of Bitzakidis et al., and further in view of Fergason, for the purpose of reducing the amount of power consumed by the device since light is no longer wasted in illuminating portions of the display panels that are not required to be illuminated (i.e. light is guided only to those areas of the panel that requires illumination).

16. Claims 36, 38-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ge et al. in view of Bitzakidis et al.

Ge et al. in view of Bitzakidis et al. discloses the invention as set forth above in Claims 1, 9-13, 21, 23-24, 26, 28-29, 31, 33-34, except for the transmittance of the liquid crystal including 100%. However, it is well known and conventional in the art for the transmittance of a liquid crystal element to vary from a range of 0% to 100%, inclusive, based on the voltages applied to the electrodes sandwiching the liquid crystals. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the transmittance of the liquid crystal include 100%, to provide maximum light throughput through the light panel, as well as provide maximum

contrast with regard to other portions of the light panel which may be transmitting light at variable levels other than 100%.

17. Claims 37 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ge et al. in view of Bitzakidis et al. as applied to Claims 2-4, 14-20, 22, 25, 27, 30, 32, 35 above, and further in view of Fergason.

Ge et al. in view of Bitzakidis et al., and further in view of Fergason discloses the invention as set forth above in Claims 2-4, 14-20, 22, 25, 27, 30, 32, 35, except for the transmittance of the liquid crystal including 100%. However, it is well known and conventional in the art for the transmittance of a liquid crystal element to vary from a range of 0% to 100%, inclusive, based on the voltages applied to the electrodes sandwiching the liquid crystals. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the transmittance of the liquid crystal include 100%, to provide maximum light throughput through the light panel, as well as provide maximum contrast with regard to other portions of the light panel which may be transmitting light at variable levels other than 100%.

Conclusion

18. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

19. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Arnel C. Lavarias whose telephone number is 571-272-2315. The examiner can normally be reached on M-F 9:30 AM - 6 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on 571-272-2312. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Arnel C. Lavarias
4/19/05

THONG NGUYEN
PRIMARY EXAMINER
GROUP 2800